Patent Claims

1. Apparatus for monitoring muscle activity, said apparatus comprising

5   - means for providing signals indicative of muscle activity, for example EMG-
signals,
- means for processing of said signals in order to detect a particular activity,
- means for providing a feedback signal,
wherein said device is designed in order to be individually adaptable in a set-up
10   mode.

2. Apparatus according to claim 1, c h a r a c t e r i z e d   i n   that said apparatus
is designed with means for sensing and registering of a normally occurring muscle
activity.
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3. Apparatus according to claim 1 or 2, c h a r a c t e r i z e d   i n   that said
apparatus is designed with means for sensing and registering of an essentially
maximal muscle activity, for example a maximal jaw clenching activity.

20   4. Apparatus according to claim 1, 2 or 3, c h a r a c t e r i z e d   i n   that said
apparatus is designed for sensing and registering muscle activity during one or more
predefined normally occurring muscle activities, such as one or more grimaces.

5. Apparatus according to one or more of claims 1 to 4, c h a r a c t e r i z e d   i n
25   that said apparatus comprises means for registering and storing muscle activity
during a time interval.

6. Apparatus according to one or more of claims 1 to 5, c h a r a c t e r i z e d   i n
that said apparatus is designed to be individually adaptable by having means for
30   adjusting said feedback signal.

7. Apparatus according to one or more of claims 1 to 6, c h a r a c t e r i z e d i n that said means for processing of said signals in order to detect a particular activity comprises means for pattern recognition.

5   8. Apparatus according to one or more of claims 1 to 7, c h a r a c t e r i z e d i n that said means for providing signals indicative of muscle activity comprises one or more electrodes for sensing of EMG-signals.

9. Apparatus according to one or more of claims 1 to 8, c h a r a c t e r i z e d i n
10   that said means for providing signals indicative of muscle activity comprises one or more electrodes for sensing of EEG-signals.

10. Apparatus according to claim 8 or 9, c h a r a c t e r i z e d i n that said device comprises means for testing said electrodes and in particular the connectivity
15   to the user by supplying a test voltage to the electrode(s), possibly as a superimposed voltage, measuring the resulting current and comparing the resulting current with reference value(s).

11. Apparatus according to one or more of claims 1 to 10, c h a r a c t e r i z e d
20   i n that said means for providing signals indicative of muscle activity comprises a microphone, a sensor for sensing of vibrations and/or other sensor means.

12. Apparatus according to one or more of claims 1 to 11, c h a r a c t e r i z e d
i n that said apparatus comprises means for storing data corresponding to measured
25   and/or processed signals.

13. Apparatus according to claim 14, c h a r a c t e r i z e d i n that the apparatus comprises means for transferring stored data to a computer, e.g. a PC or the like.

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14. Apparatus according to one or more of claims 1 to 13, c h a r a c t e r i z e d
i n that said apparatus can be operated in a set-up mode and a use-mode, that in

said set-up mode individual reference signals, signals corresponding to specific individual muscle activities and individual bio-feedback signal characteristics may be set-up, and that in said user mode the device may monitor muscle activity and provide bio-feedback in accordance with predefined rules and settings.

15. Apparatus according to one or more of claims 1 to 14, c h a r a c t e r i z e d i n that apparatus comprises a user module for wearing on the head, e.g. on the forehead, on or in the ear, etc.

16. Apparatus according to one or more of claims 1 to 15, c h a r a c t e r i z e d i n that apparatus comprises a slave module and a master module, said slave module being designed for wearing by a human being.

17. Apparatus according to one or more of claims 1 to 16, c h a r a c t e r i z e d i n that said apparatus comprises charging means, e.g. for said user module or for said slave module.

18. Apparatus according to claim 16, 17 or 18, c h a r a c t e r i z e d i n that said apparatus comprises means for indicating operating steps to a user such as visual means, e.g. a LED, or acoustic means.

19. Apparatus according to one or more of claims 15 to 18, c h a r a c t e r i z e d i n that said apparatus comprises display means for displaying instructions and/or results stemming from a monitoring session.

20. Method of monitoring muscle activity, said method comprising the steps of

- providing signals indicative of muscle activity, for example EMG-signals,
- processing of said signals in order to detect a particular activity, said processing of said signals taking into consideration specific individual parameters and/or references, and

providing a feedback signal in case a particular activity has been detected.

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21. Method according to claim 20, c h a r a c t e r i z e d   i n   that said feedback is provided on the basis of an evaluation comprising a maximum force calculation, an area calculation and/or a pattern recognition process on the basis of a FFT-processing (Fast Fourier Transform).

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22. Method of setting up an apparatus according to one or more of claims 1 to 19, whereby

> - an essentially maximal muscle activity such as a maximal jaw clenching is performed and the corresponding muscle activity is sensed and registered,
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> - one or more predefined muscle activities is/are performed, e.g. grimaces, and the corresponding muscle activity is sensed and registered, and
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> - a threshold value for outputting of a feedback-signal is adjusted.

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23. Method of setting up an apparatus according to one or more of claims 1 to 19, possibly subsequent to a setting-up procedure in accordance with claim 22, whereby

> - said method comprises the steps of using the apparatus in a set-up mode, whereby values and/or parameters corresponding to individual muscle activities are registered and possibly stored for one or more periods of time, and
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> - whereby said registered and/or stored values and/or parameters are utilized for providing individual reference values for normal use of the apparatus.

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24. Use of apparatus according to one or more of claims 1 to 19 and/or a method according to one or more of claims 20 – 23 for preventive treatment of bruxism.

25. Use of apparatus according to one or more of claims 1 to 19 and/or method according to one or more of claims 20 – 23 for corrective monitoring of human body positioning and/or movements.

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26. Use of apparatus according to one or more of claims 1 to 19 and/or method according to one or more of claims 20 – 23 for adjusting of human body positioning and/or movements during work activity.